

DDM04-010

RESP1

3

IN THE CLAIMS

1. (Currently Amended) A method for evaluating operation of a compression cooling system; said cooling system including a condenser unit; said cooling system including a refrigerant-saturated-assured locus within said condenser unit; said cooling system including a refrigerant-liquid-assured locus generally adjacent to said condenser unit; the method comprising the steps of:
 - (a) in no particular order:
 - (1) measuring a first temperature of said refrigerant in a saturated state; said measuring said first temperature being effected within said refrigerant-saturated-assured locus; and
 - (2) measuring a second temperature of said refrigerant in a liquid state; said measuring said second temperature being effected within said refrigerant-liquid-assured locus; and
 - (b) calculating a difference between said first temperature and said second temperature to determine the extant amount of subcooling to which said refrigerant is subjected; subjected; and
 - (c) comparing said extant amount of subcooling with a predetermined acceptable amount of subcooling to effect said evaluating.
2. (Currently Amended) A method for evaluating operation of a compression cooling system as recited in Claim 1 wherein the method comprises the further step of:
 - (e) comparing said extant amount of subcooling with a predetermined acceptable amount of subcooling
 - (d) changing amount of refrigerant in said cooling system when said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by greater than a predetermined difference.

DDM04-010

RESP1

4

3. (Currently Amended) A method for evaluating operation of a compression cooling system as recited in Claim 2 wherein ~~the method comprises the further step of:~~
~~(d) changing amount of refrigerant in said cooling system when said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by greater than a predetermined amount~~ said cooling system includes a microprocessor control unit coupled for controlling said cooling system, and wherein said comparing is effected in said microprocessor control unit; said predetermined acceptable amount of subcooling being stored in said microprocessor control unit.
4. (Currently Amended) A method for evaluating operation of a compression cooling system as recited in Claim 1 Claim 2 wherein ~~the method comprises the further step of:~~
~~(e) adding refrigerant to said cooling system when said extant amount of subcooling is less than a predetermined acceptable amount of subcooling~~ said cooling system includes a control unit coupled for controlling said cooling system; said control unit being in communication with a distal site remotely located from said cooling system; said comparing being effected in at least one of said control unit and said distal site; said predetermined acceptable amount of subcooling being stored in at least one of said control unit and said distal site.
5. (Currently Amended) A method for evaluating operation of a compression cooling system as recited in Claim 3 Claim 2 wherein the method comprises the further step of:
(e) repeating steps (a) through (d) until said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by less than said predetermined amount difference.

DDM04-010

RESP1

5

6. (Currently Amended) A method for evaluating operation of a compression cooling system as recited in Claim 4 Claim 3 wherein the method comprises the further step of:
(d) repeating steps (a) through (c) until said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by less than ~~a~~ than said predetermined amount difference.
7. (Currently Amended) A method for evaluating refrigerant charge in a compression cooling system; said system including a first system portion in which said refrigerant is substantially always in a saturated state and a second system portion in which said refrigerant is substantially always in a liquid state; the method comprising the steps of:
 - (a) in no particular order:
 - (1) measuring a first temperature of said refrigerant in said first system portion; and
 - (2) measuring a second temperature of said refrigerant in said second system portion;
 - (b) calculating a difference between said first temperature and said second temperature to determine the extant amount of subcooling effected by said system; and
 - (c) comparing said extant amount of subcooling with a predetermined acceptable amount of subcooling to effect said evaluating.
8. (Currently Amended) A method for evaluating refrigerant charge in a compression cooling system as recited in Claim 7 wherein the method comprises the further step of:

DDM04-010

RESP1

6

(e) comparing said extant amount of subcooling with a predetermined acceptable amount of subcooling

(d) changing amount of said refrigerant in said cooling system when said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by greater than a predetermined difference.

9. (Currently Amended) A method for evaluating refrigerant charge in a compression cooling system as recited in Claim 8 wherein ~~the method comprises the further step of:~~

(d) changing amount of refrigerant in said cooling system when said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by greater than a predetermined amount said cooling system includes a microprocessor control unit coupled for controlling said cooling system, and wherein said comparing is effected in said microprocessor control unit; said predetermined acceptable amount of subcooling being stored in said microprocessor control unit.

10. (Currently Amended) A method for evaluating refrigerant charge in a compression cooling system as recited in Claim 7 wherein ~~the method comprises the further step of:~~

(e) adding refrigerant to said system when said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by less than a predetermined amount said cooling system includes a control unit coupled for controlling said cooling system; said control unit being in communication with a distal site remotely located from said cooling system; said comparing being effected in at least one of said control unit and said distal site; said predetermined acceptable amount of subcooling being stored in at least one of said control unit and said distal site.

DDM04-010

RESP1

7

11. (Currently Amended) A method for evaluating refrigerant charge in a compression cooling system as recited in Claim 9 Claim 8 wherein the method comprises the further step of:

(e) repeating steps (a) through (d) until said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by less than said predetermined amount difference.

12. (Currently Amended) A method for evaluating refrigerant charge in a compression cooling system as recited in Claim 10 Claim 9 wherein the method comprises the further step of:

(d) repeating steps (a) through (c) until said extant amount of subcooling differs from said predetermined acceptable amount of subcooling by less than a than said predetermined amount difference.

13. (Currently Amended) A compression cooling system comprising:

(a) a compressor, an evaporator and a condenser fluidly coupled by at least one fluid carrying line containing a refrigerant; said cooling system including a refrigerant-saturated-assured locus within said condenser; said cooling system including a refrigerant-liquid-assured locus in said fluid carrying line between said condenser and said evaporator generally adjacent to said condenser unit;

(b) a first temperature measuring device connected with said system for measuring a first temperature of said refrigerant in a saturated state; said measuring being effected within said refrigerant-saturated-assured locus; and

(c) a second temperature measuring device connected with said system for measuring a second temperature of said refrigerant in a liquid state; said

DDM04-010

RESP1

8

measuring said second temperature being effected within said refrigerant-liquid-assured locus; and

(d) a calculating device coupled with said first temperature measuring device and said second temperature measuring device; said calculating device calculating a difference between said first temperature and said second temperature to determine an extant amount of subcooling effected by said system.

14. (Currently Amended) A compression cooling system as recited in Claim 13 wherein the system further comprises:

(d) a calculating device coupled with said first temperature measuring device and said second temperature measuring device; said calculating device calculating a difference between said first temperature and said second temperature to determine an extant amount of subcooling effected by said system

(d) a reservoir unit coupled with said fluid carrying line via a control valve; and

(e) a microprocessor control unit coupled with said calculating device and coupled for controlling said control valve; said microprocessor control unit operating said control valve for changing amount of refrigerant in said fluid carrying line when said extant amount of subcooling differs from a predetermined acceptable amount of subcooling by greater than a predetermined difference.

15. (Currently Amended) A compression cooling system as recited in Claim 14 wherein the system further comprises:

(e) fluid access fittings in said fluid carrying line for effecting fluid communication with the system from without the system; said fluid access fittings being configured to accommodate a user coupling a refrigerant

DDM04-010

RESP1

9

~~source with said fittings for changing charge of said refrigerant within said system when said extant amount of subcooling differs from a predetermined acceptable amount of subcooling by greater than a predetermined amount~~
said microprocessor control unit includes said calculating device, and
wherein said predetermined acceptable amount of subcooling is stored in
said microprocessor control unit.

16. (Currently Amended) A compression cooling system as recited in Claim 15 wherein
~~said predetermined acceptable amount of subcooling is provided to said user by a tool; said tool being external of said system~~ said microprocessor control unit is in communication with a distal site remotely located from said cooling system;
said calculating being effected in at least one of said microprocessor control unit and said distal site; said predetermined acceptable amount of subcooling being stored in at least one of said microprocessor control unit and said distal site.
17. (Currently Amended) A compression cooling system as recited in ~~Claim 15~~ Claim 13 wherein
~~said predetermined acceptable amount of subcooling is provided to said user by said calculating device~~ the system further comprises:
(d) a reservoir unit coupled with said fluid carrying line via a control valve; and
(e) a control unit coupled with said calculating device and coupled for controlling said control valve; said control unit operating said control valve for changing amount of refrigerant in said fluid carrying line when said extant amount of subcooling differs from a predetermined acceptable amount of subcooling by greater than a predetermined difference.
18. (Currently Amended) A compression cooling system as recited in ~~Claim 13~~ Claim 17 wherein the system further comprises:

DDM04-010

RESP1

10

(e) fluid access fittings in said at least one fluid carrying line for effecting fluid communication with the system from without the system; said fluid access fittings being configured to accommodate a user coupling a refrigerant source with said fittings for changing charge of said refrigerant within said system when said extant amount of subcooling differs from a predetermined acceptable amount of subcooling by greater than a predetermined amount
said control unit includes said calculating device, and wherein said predetermined acceptable amount of subcooling is stored in said control unit.

19. (New) A compression cooling system as recited in Claim 18 wherein said control unit is in communication with a distal site remotely located from said cooling system; said calculating being effected in at least one of said control unit and said distal site; said predetermined acceptable amount of subcooling being stored in at least one of said control unit and said distal site.